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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10,047,420	01/14/2002	Hideo Tanaya	9319S-000321	2480

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EXAMINER

DOUGHERTY, THOMAS M

ART UNIT PAPER NUMBER

2834

DATE MAILED: 05/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary****Application No.**

10/047,420

**Applicant(s)**

TANAYA ET AL.

**Examiner**

Thomas M. Dougherty

**Art Unit**

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17,20-23 and 26-32 is/are rejected.
- 7) ☒ Claim(s) 18,19,24 and 25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 402.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debely (US 4,384,232) in view of Staudte (US 3,683,213). Debely shows (figs. 1-6) vibrating piece comprising: a base (1), and a vibration arm section (2 or 3) formed so as to protrude from the base (1), a grooved portion (4 or 5) being formed in at least one of an obverse surface and a rear surface of said vibration arm section (2 or 3), and an electrode section (8) formed in a part of said grooved portion (4 or 5, 36 or 39 etc.).

Said electrode section (8) further comprises an excitation electrode, note in claim 1 that an electrical field is produced by the electrodes (e.g. an exciting function).

Debely shows a fixation area (between the tines and the base) for fixing the vibrating piece (2 or 3) is provided in said base.

Debely does not show a cut section is formed in said base

Staudte shows (fig. 4) vibrating piece comprising: a base (not numbered), and a vibration arm section (not specifically numbered) formed so as to protrude from the base, wherein a cut section (51) is formed in said base.

Staudte shows (45a,b) an excitation electrode, note that as the device is a resonator, and is driven, the electrodes perform an excitation function).

Staudte does not show a grooved portion being formed in at least one of an obverse surface and a rear surface of said vibration arm section, and an electrode section formed in a part of said grooved portion.

It would have been obvious to one having ordinary skill in the art to add cut portions to the base of Debely at the time of his invention as is shown by Staudte because the cuts or recesses as Staudte calls them have the result of increasing the electro-mechanical (Q) coupling of the resonator.

Regarding the claimed frequency range this is regarded as a goal of the invention, which inherently is met by the combined invention of Staudte and Debely since they show each claimed feature. Thus at this time, this does not constitute a limitation in any patentable sense.

Claims 23, 26-29 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debely (US 4,384,232) and Staudte (US 3,683,213) further in view of Nakamura (US 4,223,177). Given the combined invention of Debely and Staudte as noted above, they do not show a package in a box shape. Nakamura shows (fig. 1) a box-shaped package (1, 11) for a piezoelectric resonator. He doesn't show a base with an arm extending wherein the base has a cut and the arm a groove with an electrode in it.

It would have been obvious to one of having ordinary skill in the art to enclose the combined invention of Debely and Staudte in a box-shaped package, as shown by Nakamura, because such a package allows the resonator to be mounted on a circuit board in a single-inline-package. In addition to allowing the device to be mounted and

be given signals through the single-inline-package, the packaging would allow for the device itself to be physically protected.

Claims 23, 26, 27, 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debely (US 4,384,232) and Staudte (US 3,683,213) further in view of Curran et al. (US 3,423,700). Given the combined invention of Debely and Staudte as noted above, they do not show a package in a cylindrical shape. Curran et al. show (fig. 1) a cylinder-shaped package (24, 35) for a piezoelectric resonator. He doesn't show a base with an arm extending wherein the base has a cut and the arm a groove with an electrode in it.

It would have been obvious to one of having ordinary skill in the art to enclose the combined invention of Debely and Staudte in a cylinder-shaped package, as shown by Curran et al., because such a package allows the resonator to be mounted on a circuit board in a dual-inline-package. In addition to allowing the device to be mounted and be given signals through the dual-inline-package, the packaging would allow for the device itself to be physically protected.

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Debely (US 4,384,232) and Staudte (US 3,683,213) further in view of Kikushima (US 5,912,592). Given the combined invention of Debely and Staudte as noted above, they do not show a package with their vibrating piece and integrated circuit housed in the package. Kikushima notes an oscillator having a vibrating piece and an integrated circuit housed in a package. See col. 4, lines 16-22. He doesn't show a base with an arm extending wherein the base has a cut and the arm a groove with an electrode in it.

It would have been obvious to one of having ordinary skill in the art to enclose the combined invention of Debely and Staudte together with an integrated circuit in a package, as shown by Kikushima, because such a package allows the resonator to be mounted on a circuit board. In addition to allowing the device to be mounted and be given signals through the dual-inline-package, the packaging would allow for the device itself to be physically protected. Finally it would have been obvious to include an integrated circuit device in the package in order to save space on such a circuit board.

***Allowable Subject Matter***

Claims 18, 19, 24 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to show or fairly suggest employment of an electrode section in a part of a grooved portion of a vibrating tine, arm or cantilever component wherein the crystal impedance value ratio of a vibrating piece becomes 1.0 or more, nor is shown extension of the electrode section in the grooved portion approximately 45% to 55% of the length of the groove, wherein the vibrating tine, arm or cantilever component is connected to a base which itself has a cut portion.

***Conclusion***

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The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The remaining prior art cited reads on at least some aspects of the claimed invention.

Direct inquiry concerning this action to Examiner Dougherty at (703) 308-1628.

*hand*  
tmd

May 21, 2003

*Thomas M. Dougherty*  
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